Some Chemical Treatises.

(1) *Fundamental Principles of Organic Chemistry.* By Prof. C. Moureu. Authorised Translation from the Sixth French Edition by W. T. K. Braunholtz. Pp. xviii + 399. (London: G. Bell and Sons, Ltd., 1921.) 12*s.* 6*d.* net.

(2) *A Text-book of Inorganic Chemistry.* Edited by Dr. J. N. Friend. Vol. 9, part 2, *Iron and its Compounds.* By Dr. J. N. Friend. (Griffin's Scientific Text-books.) Pp. xxv + 265. (London: Charles Griffin and Co., Ltd., 1921.) 18*s.*

(3) *A Dictionary of Chemical Solubilities. Inorganic.* First edition by Dr. A. M. Comey. Second edition, enlarged and revised, by Dr. A. M. Comey and Prof. Dorothy A. Hahn. Pp. xviii + 1141. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1921.) 72*s.* net.

(1) THE wealth of material comprehended by organic chemistry constitutes a very real and formidable difficulty to the instructor in that branch of science. It is calculated that up to the present time more than two hundred thousand organic substances have been discovered and described, and the number is being steadily added to week after week. It is obviously impossible for any lecturer on the subject to deal with more than a very small fraction of this *materia chemica.* Nor is there any reason why he should. Fifty or sixty years ago organic chemistry was scarcely taught in our universities, and, even when taught, was treated in a lifeless, unsystematic manner. Students, far from being attracted towards it, were frankly bored by the uninteresting recapitulation of empirical facts, methods of preparation, and physical properties, which usually made up the substance of the teacher's prelections. All this, however, is now changed. The enormous accretion of fact has been brought under law and order. The whole has been collated, and, for the most part, reduced to fundamental principles. The view of the village is no longer obscured by the houses.

It is with these fundamental principles alone, based upon the co-ordination of facts, or groups of facts, that the teacher of organic chemistry to-day can concern himself, if he would seek to convey any adequate conception of the field of study occupied by that department of science. In the hands of a capable, well-informed man, gifted with philosophic insight and endowed with the faculty of exposition, tuition in organic chemistry can be made a most fascinating occupation. To supplement the teacher's work in the lecture-room, however, the students should be provided with a well-ordered text-book, dealing with the principles concerned. Such a book is that under review. In its original form it has already been noticed in these columns. Since that time it has gone through many editions, and has found its way beyond French university circles. The sixth French edition has now been translated into English by Mr. Walter T. K. Braunholtz, and appears with an introduction from Prof. Sir William J. Pope, of the University of Cambridge.

We heartily commend Prof. Moureu's book to all—both teachers and taught—to whom the philosophic aspects of organic chemistry appeal. No more interesting work on the subject has appeared within recent years. It is written with that clarity, logical sense, faculty of arrangement, and sense of proportion which are such striking characteristics of French scientific literature. We trust that in its English dress it will have a reception commensurate with its great merits.

(2) As was mentioned in a former notice in NATURE of vol. 9 of Dr. Newton Friend's great work on inorganic chemistry, it has been found necessary to treat the subject of iron in a separate part of that volume, on account of the great importance of the metal and the voluminous literature which has grown round it. This has been found so great that it has been deemed desirable to subdivide the volume still further. The part now under review treats of the chemistry of iron and its compounds, its metallurgy being relegated to part 3, which is being dealt with by the editor in collaboration with Mr. W. H. Hatfield.

The general plan of part 2 is similar to that of the preceding volumes. It opens with an account of the early history of iron as a metal, beginning with the use of meteoric iron by prehistoric man, and of smelted iron by the Egyptians, Ethiopians, Assyrians, and Israelites. According to authorities quoted by Dr. Friend, India acquired her knowledge of iron from Babylon. The famous pillar at Delhi is far from being so old as is usually surmised. It dates back probably to about A.D. 300. Greece was the first country in Europe to use iron—probably about 1400 B.C. It was known in Britain about a century before the Roman invasion, when, as mentioned by Cæsar, it was used in the form of bars for currency. Specimens of these bars are in the British Museum and in the Worcester Museum. Chap. 2 is concerned with the mineralogy of iron, and gives an account of its ores and other ferruginous minerals, many of which, of course, are of no importance as sources of the metal. It is noteworthy that the mean percentages of ferrous and ferric oxides contained in American igneous rocks are considerably less than in similar British rocks. Chap. 3 treats of the preparation and properties of pure iron, the passivity of iron, its action as a catalyst, etc. A short section on its atomic weight is contributed by Mr.

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Little. The final value 55·84 is sufficiently far from a whole number to suggest the existence of isotopes, for there is every reason to believe that this value is well established. In view of Dr. Aston's work, and the resuscitation of Prout's hypothesis, it will be interesting to learn how the difference from the integer is to be accounted for. Chap. 4 deals with the important subject of the corrosion of iron, of which the editor has made a special study. It is, however, remarkable, in spite of the large amount of work which has already been done on this subject, how much remains to be ascertained. The remaining chapters, five in number, deal with the general properties of iron salts, of its compounds with hydrogen and the halogens, and with the elements of Groups VI., V., IV., and III. of the Periodic Table. The whole concludes with a chapter on the detection and estimation of iron.

As in the case of the entire work, a special feature is a wealth of bibliographical reference. Practically every statement can be verified by reference to the original source of information. This, of course, adds greatly to the value of the treatise as a compendium, but it is naturally not of much service to the student without access to a well-found library. There is probably no single library in London in which all the books thus referred to could be found.

A new feature in the work is the inclusion of a table giving a list of important journals and periodicals dealing with chemical matters, with the dates of issue of their several volumes, from the year 1800 down to 1919. It was compiled by Mr. Clifford, the librarian of the Chemical Society, and occupies some eight pages of the book. Its value to the book itself is not very apparent, since the date of publication in the case of any particular reference is invariably given in the footnote. The table has no special appropriateness to the volume under review; its proper place would be either at the beginning or the end of the completed work.

(3) The "Dictionary of Chemical Solubilities," by Drs. A. M. Comey and Dorothy A. Hahn, is a revised and enlarged edition of a work by the first-named author which appeared in 1895, and which, in its turn, followed the well-known "Dictionary of Solubilities" compiled in 1864 by Prof. F. H. Storer on a plan indicated so far back as 1731 by Peter Shaw. Storer's book is long since out of print, and no attempt has been made to bring it up to date and to reissue it. During the quarter of a century which has elapsed since the first edition of Dr. Comey's work a large amount of additional matter relating to the solubilities of inorganic substances, with which the book is alone concerned, has made its appearance. This has been carefully brought together by Dr. Dorothy A. Hahn, of Mount Holyoke College, and forms the material upon which the present edition is based. It constitutes a volume of 1140 closely printed pages, and its subject-matter has been brought down to 1916. Its printing and publication have been delayed by circumstances arising out of the war.

In a work of this kind easy reference is of primary importance, and opinions may differ as to the best arrangement to adopt. The one used is practically alphabetical, but it will be obvious that such a scheme leads to occasional anomalies, which could be obviated only by elaborate cross-referencing, thereby adding considerably to the bulk of the volume. In the case of discrepant statements by different observers, no attempt at a critical selection has been made, which we think detracts from the value and authority of the work. A careful examination of the original papers and of the methods and apparatus employed would have enabled a satisfactory judgment to be reached, and thereby obviated much unnecessary printing. Methods of determining the solubilities of gases, for example, have been improved greatly since Bunsen's time, and many of his estimations have been superseded by more accurate observations. It serves no useful purpose to retain them, and indeed only confuses the searcher, who is not in a position to discriminate between the several observers. The compilers may rightly say they have done their best to deal with the enormous mass of material they have collected, but they can scarcely have escaped the conviction that much of the numerical data rests upon a very insecure experimental basis. The fact is, it is only within quite recent times that methods of estimating solubilities have reached the necessary precision, and that sources of error hitherto overlooked have been obviated.

In spite, however, of these difficulties and imperfections, the present work is the most comprehensive compilation on the subject which has yet appeared in any language, and a word of commendation is due to Dr. Hahn for the patience, care, and assiduity with which she has collected the vast amount of material with which she has had to deal.

Formal and Philosophical Aspects of Logic.

Logic. By W. E. Johnson. Part 1. Pp. xl+255. 16*s.* net. Part 2. Demonstrative Inference: Deductive and Inductive. Pp. xx+258. 14*s.* net. (Cambridge: At the University Press, 1921, 1922.)

A LOGICIAN is a person who takes infinite pains to solve problems which present no manner of difficulty to ordinary mortals. This may be, and no doubt is, because ordinary mortals live and die unconscious of

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